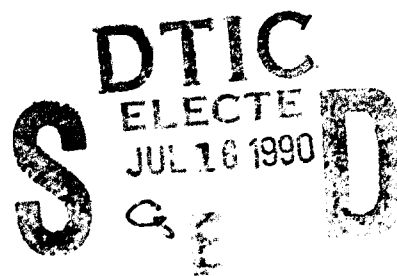


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COPING STRATEGIES AND MOOD DURING COLD WEATHER TRAINING

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Coping Strategies and Mood During Cold Weather Training*

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SUMMARY

Cold weather military manuals consistently identify adverse emotional reactions as a problem in this situation. It may be possible to minimize this problem by helping men learn appropriate coping strategies. The present study was designed to evaluate the types of coping strategies that men use in the cold and to evaluate their effects on emotional reactions to the cold. A comparison was made between a winter cold weather training sample and a summer mountain warfare training sample to evaluate the effects of cold weather on emotional status and coping strategies and whether any observed differences in coping strategies could account for any observed differences in mood.

Measures of coping and emotional status were obtained by self-report questionnaires after a 4-day field exercise. The coping questionnaire provided 9 psychometrically acceptable measures of coping strategies which were broadly classified as strategies oriented toward problem solving (e.g., making a plan and following it) and strategies oriented toward emotional control or its absence (e.g., self-blame, humor, escapist thinking). The mood questionnaire provided measures of affective states (anger, depression, fear/anxiety, and happiness) and psychological arousal states (activity, fatigue). Self-reports of prior experience with cold weather, mountain warfare, jungle, and desert training were obtained to correlate prior experience with coping and emotional reactions to training.

Multivariate analyses of variance and covariance, including tests for parallelism of regression lines, tested hypotheses about differences between the summer and winter training groups. The major findings were:

- (a) Anger, Fear/Anxiety, and Depression were higher during cold weather training, and Happiness and Activity were lower during this training. The exception to the general trend was that fatigue was comparable in both training groups.
- (b) Cold weather trainees reported more escapist thinking about better times and places, and there was a trend toward less frequent problem solving and planning in the cold.
- (c) Positive moods were higher among men who employed problem solving and related coping strategies; negative moods were higher among men who employed escapist thinking and related coping strategies.
- (d) Controlling for differences in escapist thinking eliminated the mood differences between the summer and winter samples.

- (e) Men with prior cold weather training reported more frequent use of problem solving strategies for both summer and winter training.

The results indicate that differences in coping strategies can explain emotional reactions to cold. Identification of factors influencing the choice of coping strategy in the cold would provide insight into possible methods of minimizing these adverse psychological reactions. Research to identify these factors should focus on isolating the specific aspects of training that promote the use of adaptive mechanisms to make it possible to design training experiences to ensure optimum learning and performance.

INTRODUCTION

The importance of psychological adjustment in cold weather military operations has been well-documented in operational handbooks (2,4,7-11,13). Indeed, one recent handbook asserts that "The psychological effects of the cold on man can be the most debilitating and hardest to prevent . . . " (9). Current psychological stress theories take the general position that how people adjust to or cope with demanding situations affects their psychological state, including morale and motivation, thereby influencing performance. Adverse reactions to cold weather operations represent one specific instance of this general position. Coping theories also assert that coping strategies can be modified through appropriately structured training experiences, one of the recommended approaches to dealing with the psychological reactions to cold weather (9). Applying stress theory to the problems of cold weather training, the present study, therefore, examined relationships between coping style and mood in Marines going through cold weather training. To determine how the specific experience of cold weather training affected coping and its relationship to mood, the responses of these men were compared to those of a comparable sample going through summer training at the same training site. An initial exploration also was made of the effects of prior experience in the cold on coping.

The study addressed three specific questions. First, is the pattern of coping strategies employed in cold weather different from that in warmer weather? Second, if differences in the pattern of coping strategies do exist, can these differences account for the effects of cold on emotional status? The third question was whether prior training experiences were related to choice of coping strategies during cold weather training.

The answers to the three questions were sought in the context of a general conceptual model developed to describe coping reactions of individuals facing a variety of stressful life situations. The conceptual model underlying the questions outlined above assumes that demanding or stressful situations are necessary to elicit coping (5,6). In the absence of effective coping, these situations can produce strong negative emotions and are, therefore, plausible antecedents of the maladaptive behavior patterns sometimes seen in the cold. However, the effects of these maladaptive patterns should be evident initially in the form of relatively milder negative moods and related psychological states. In prior research,

coping measures have been broadly classified as representing problem-solving and emotion-focused components (3). Using this classification, problem solving coping tends to be associated with less negative affect and emotion-focused coping with more negative affect.

The central predictions in the present study were that emotion-focused coping strategies would be more evident in the cold, that problem-solving strategies would be less evident in the cold, and that these differences could account for prior observations of more negative affect in the cold. These predictions were tested by measuring coping strategies and mood in Marines going through two physically rigorous training programs. One sample of men was undergoing winter cold weather training, and the other sample was undergoing summer mountain warfare training. Both training programs were conducted at the same training site, so the primary differences between the two groups were the specific activities for each type of training and the climatic conditions. The inclusion of the warm weather group provided a reference point for evaluating the influence of cold weather operations on coping and its effects. This reference point made it possible to evaluate the extent to which any deviations from previously reported effects of coping were merely the result of studying a different population or a military training setting, rather than being related to climate.

Five sets of analyses were conducted in the present study to test predictions regarding the three central research questions. The effects of cold weather on coping were evaluated by comparing the reported coping strategies in the Cold Weather and Mountain Warfare groups. The influence of coping on emotional status in the cold was assessed by determining which coping strategies were associated with the types of negative affect described as common in cold weather and to determine whether alternative strategies could blunt these affective responses. As a preliminary to these analyses, the mood states of men going through cold weather training were compared to those going through mountain warfare training to verify prior clinical observations regarding emotional status. An additional preliminary step to directly addressing the second question was provided by the examination of coping-mood associations to verify that relationships noted in other settings (1,3) also appeared in the cold. The answer to the third question was sought in analyses that compared individuals who had been through prior cold weather training with individuals who had not. The

intent was to determine whether coping strategies alter systematically in any way as people acquire more experience with the types of situations encountered in the cold.

METHOD

Sample. The men who participated in the study were volunteers who solicited from two companies of Marines going through mandatory training programs. These volunteers agreed to participate in the research after the project was described to them.

The study participants in the two samples differed somewhat with respect to demographic characteristics (Table 1). The Mann-Whitney U-test was used to compare the groups, because the distributions of many of the variables were highly skewed. By this test, the mountain warfare sample was significantly higher on prior education ($p < .041$), self-rated physical fitness ($p < .047$), and prior experience with mountain warfare training ($p < .001$) and desert warfare training ($p < .001$). The Cold Weather training group had more prior experience with cold weather training ($p < .001$). A higher average level of reported prior experience with jungle warfare training was found in the Mountain Warfare sample, but closer examination of the data indicated that this difference was attributable to a few individuals who reported extensive prior experience (> 10 times).

Table 1
Demographic Characteristics of Mountain Warfare
and Cold Weather Samples

	Mountain Warfare		Cold Weather		Mann-Whitney U Test Significance
	Mean	S.D.	Mean	S.D.	
Age	22.8	3.8	22.4	3.3	.672
Length of Service (Months)	45.9	39.5	43.1	35.5	.536
Rank	5.3	6.9	5.2	8.7	.674
Highest Grade Completed	12.7	1.4	12.2	.6	.040
General Health	4.2	.7	3.9	.6	.069
Physical Fitness	4.1	.8	3.9	.8	.046
Prior Training for:					
Mountain Warfare	1.4	.9	.6	.9	.001
Cold Weather	.6	1.6	.7	.6	.001
Desert Warfare	2.6	2.0	.5	1.2	.001
Jungle Warfare	3.1	13.4	.9	1.0	.122

Coping Assessment. Coping strategies were assessed by a 52-item self-report questionnaire designed to measure 8 coping styles. The questionnaire combined items from a standardized coping questionnaire (6) adapted for recruit training (18) with items derived from responses to an open-ended questionnaire administered to 58 Marines at the end of 2 months of cold weather training. The exploratory questionnaire asked how individuals had coped with cold weather, and whether the things they had done were specific to their cold weather training experience or applied to all types of training. The large majority of responses to these exploratory questionnaires could be classified as examples of previously identified coping mechanisms, but additional items were incorporated to inquire about (i) thinking about loved ones, (ii) comparing one's own situation to that of others, (iii) realizing that the situation would be over in a short time, and (iv) group activities designed to cope with the cold. Responses to the question asking whether the coping behaviors were specific to cold weather conditions indicated that almost none of the behaviors were. Instead, the coping styles appeared to be typical of all types of deployment exercise.

Psychometric analyses indicated that the new items represented aspects of coping not assessed by previously defined coping scales. For this reason, 9 coping composites were employed in the analyses:

- (a) Problem Solving assessed attempts to understand problems and plan and implement solutions (7 items, $\alpha = .78/.80$, given as value for mountain warfare sample/cold weather sample).
- (b) Seeking Support assessed attempts to obtain additional information or reassurance from other people (5 items, $\alpha = .65/.65$).
- (c) Self-blame assessed the tendency to blame one's self for problems encountered (3 items, $\alpha = .51/.69$).
- (d) Positive Reappraisal assessed attempts to see the personal benefits from dealing with the demands of training and related problems (3 items, $\alpha = .64/.72$).
- (e) Comparison to Alternatives assessed the extent to which the person thought about ways in which the situation could be worse (3 items, $\alpha = .60/.65$).
- (f) Escape assessed the tendency to think about getting away from the current situation by returning home and/or getting out of the

Marine Corps (6 items, $\alpha = .69/.62$).

- (g) Wishful Thinking assessed wishing that it was possible to change one's self in a positive way (4 items, $\alpha = .56/.61$).
- (h) Emotional Control assessed attempts to control feelings and minimize their expression in one's behavior (5 items, $\alpha = .63/.64$).
- (i) Humor assessed the use of jokes and attempts to forget problems (3 items, $\alpha = .52/.46$).

More than 9 coping composites actually were considered, but several were dropped from further consideration when analysis showed that their internal consistency estimates were substantially less than .50 in both samples.

The 9 coping composites retained for this study had low to moderate internal consistency estimates relative to typical psychological measures. This possible limitation of the composites was not considered critical, because it could be expected with brief scales that cover wide behavioral and/or cognitive domains (14). Also, moderate internal consistency estimates are typical of coping measures, and similar composites have been useful predictors of emotional states (1,3). These prior findings gave reason to believe the composites represented reliable patterns of item covariation and would be of value for the present purposes. The final set of item composites provided a reasonably detailed assessment of coping styles, while still restricting analyses to concepts which could be measured with at least minimally acceptable precision.

Mood Measurement. The mood questionnaire developed by Ryman, Biersner, and LaRocco (15) was employed to measure emotional status. This questionnaire provided measures of activity, anger, depression, fatigue, fear (or anxiety), and happiness. This inventory has been used in a variety of military settings and has consistently produced mood composites with acceptable internal consistency and sensitivity to variations in situations and events that would be expected to influence mood. The questionnaire was administered at the end of a three-day field exercise and participants were instructed to recall their feelings during this exercise. This instruction required some recall, but provided assessments that integrated feelings over a short time period where memory can be expected to be reasonably accurate. At the same time, the procedure avoided getting mood measures which merely

reflected emotional reactions to having completed the exercise rather than feelings during the exercise. Recent evidence suggests that this approach to mood assessment yields valid measurements of mood (19). Participants rated the strength of each feeling using a Likert-scale with responses ranging from "Not at all" (scored 1) to "Extremely" (scored 5).

Analysis Procedures. Pearson product-moment correlations described the bivariate linear relationships between coping and mood. Tests for interactions of type of training (Mountain Warfare versus Cold Weather) and coping as predictors of mood were provided by analyses of covariance with tests for parallelism of regression lines (17). In these analyses, a coping measure was used as a covariate, type of training was used as the grouping variable, and a test for parallelism of regression lines in the two samples was performed. One-way analyses of variance evaluated relationships between coping and experience factors. The frequency distributions for these potential antecedents of coping differences were examined and group classifications were constructed to ensure that each group included 10 or more men to ensure reasonably stable estimates of differences in the groups' average scores. These groupings were the classification variables for the analyses. All statistical analyses were conducted with SPSS^X (16).

RESULTS

Effects of Cold Weather on Coping Strategies. Multivariate analysis of variance showed significant sample differences with respect to the extent of use of different coping strategies (Hotelling's T-squared = 1.99, $p < .046$). The hypothesis that cold weather training would elicit more emotion-focused coping was supported by the presence of a significant ($p < .01$) tendency for the troops undergoing cold weather training to think more about better times and places and about getting back home (Table 2). The hypothesis that cold weather training would be associated with less frequent utilization of problem-solving coping was not supported, although there was a trend toward lower reported frequency of attention to how to solve problems ($p = .095$).

Effects of Cold Weather on Mood. The two samples differed with respect to overall mood status (Hotelling's T-squared = 4.39, $p < .001$). The largest mood differences were higher depression and lower happiness and activity scores for the Cold Weather training group (Table 2). Fatigue was the only mood scale that did not differ significantly between the samples.

Table 2
Coping and Mood Differences Between Mountain Warfare
and Cold Weather Samples

Sample:	Mountain Warfare		Cold Weather		F	Sig.
	Mean	S.D.	Mean	S.D.		
<u>Coping Scale</u>						
Problem Solving	1.78	.60	1.59	.66	2.82	.095
Seeking Support	0.79	.60	.90	.60	.97	.326
Self-blame	.94	.75	1.09	.80	1.40	.239
Reappraisal	1.76	.77	1.64	.85	.77	.383
Comparison to Alternatives	1.51	.78	1.51	.79	.00	.959
Escape	2.13	.60	2.11	.56	.01	.939
Wishful Thinking	1.03	.72	1.40	.86	6.96	.009
Emotional Control	1.32	.73	1.39	.70	.45	.502
Humor	1.56	.71	1.50	.74	.14	.711
<u>Mood Scale</u>						
Activity	3.16	.76	2.65	.76	13.39	.000
Anger	2.69	1.01	3.07	1.06	4.19	.043
Happiness	2.83	.78	2.34	.75	12.30	.001
Anxiety	1.57	.52	1.93	.77	9.58	.002
Depression	2.09	.80	2.74	.99	16.83	.000
Fatigue	2.71	.79	2.92	.88	2.25	.136

Coping-Mood Relationships. Coping-mood relationships were investigated in a series of multivariate analyses of covariance (MANCOVAs) with type of training as the grouping variable, a coping scale as the covariate, and all six mood measures as the dependent variables. This procedure tested the hypotheses that the coping variable was related to mood and that the association(s) involved were comparable for the two types of training. The output from the analysis procedure included multivariate tests for the hypothesis that the coping variable was related to mood when the moods were considered as a set and bivariate tests for the hypothesis that the coping variable was related to each mood considered separately.

Coping was significantly related to mood. The multivariate test for the association to mood was significant beyond the $p < .001$ level for Problem Solving, Reappraisal, Escape, Wishful Thinking, and Self-Blame. The tests for Seeking Support ($p < .013$) and Humor ($p < .043$) also exceeded the standard 5% significance criterion, and the test for Emotional Control approached significance ($p < .060$). Comparison to Alternatives was the only coping indicator which clearly was unrelated to mood ($p > .222$).

The coping-mood associations were comparable for the two training groups. None of the multivariate tests for nonparallelism of regression lines was statistically significant ($p > .14$ for each test).

The significant coping-mood associations were quite broad in scope, whether the data from the two samples were pooled or considered separately for each sample. When the data were pooled, 29 of 54 bivariate associations were statistically significant ($p < .05$; see Table 3). When the two samples were considered individually, 17 of 54 correlations were significant in both samples, despite the weak statistical power associated with the modest sample sizes. Each mood had a significant pooled association to at least one coping strategy, and every coping strategy except Comparison to Alternatives had at least one significant pooled correlation to a mood measure.

Although the tests for parallelism of regression lines indicated that the coping-mood associations were comparable for the two samples, Table 3 presents the findings for each sample separately to permit the inspection of sample-to-sample variability. This information has been presented, because any differences that could be replicated in subsequent research would deserve attention. However, until replicated, the differences in Table 3 should be regarded as the products of chance alone.

The patterns of association between mood and coping strategy generally confirmed the a priori hypotheses that problem solving would be associated with less negative affect and that emotional control attempts with more negative affect. The primary exceptions to the a priori hypotheses were the reliable negative associations between the Positive Reappraisal coping mechanism and the Depression and Fatigue mood scales, and between the Escape coping mechanism and the Activity and Happiness mood scales.

Effects of Cold Weather on Mood Controlling for Coping. The existence of substantial coping-mood correlations meant that the previously observed differences in coping between men undergoing Mountain Warfare and Cold Weather training might explain the differences in mood between these two groups. A MANCOVA, therefore, was conducted with Escape as the covariate and type of training as the group classification variable. Controlling for Escape, the multivariate significance test for mood differences between the two types of training did not even approach statistical significance ($p > .47$).

Table 3
Coping-Mood Associations

		Mood Scale					
		<u>Active</u>	<u>Happy</u>	<u>Angry</u>	<u>Anxious</u>	<u>Depressed</u>	<u>Fatigued</u>
<u>Problem Solving Composites</u>							
Problem Solving	MW	.50**	.40**	-.19	.06	-.31**	-.30**
	CW	.39**	.30*	-.03	.09	-.09	-.13
	Pooled Sig.	.000	.000	.236	.428	.032	.019
Reappraisal	MW	.47**	.34**	-.14	.20	-.19	-.28*
	CW	.37**	.32**	-.21	-.17	-.31**	-.25*
	Pooled Sig.	.000	.000	.056	.889	.006	.003
Seeking Support	MW	.31**	.07	.11	.13	.00	-.16
	CW	.14	.16	.11	.22*	.02	.04
	Pooled Sig.	.012	.213	.219	.042	.880	.569
<u>Emotional Control Composites</u>							
Escape	MW	-.29**	-.32**	.34**	.17	.42**	.18
	CW	-.41**	-.47**	.51**	.47**	.50**	.35**
	Pooled Sig.	.000	.000	.000	.000	.000	.002
Wishful Thinking	MW	.19	-.12	.39**	.37**	.27*	.14
	CW	-.19	-.39**	.41**	.52**	.39**	.22
	Pooled Sig.	.864	.008	.000	.000	.000	.052
Self-Blame	MW	.08	-.18	.32**	.33**	.32**	.06
	CW	-.06	-.14	.31**	.37**	.30*	.11
	Pooled Sig.	.914	.077	.000	.000	.001	.340
Emotional Control	MW	.19	-.05	.17	.13	.14	.00
	CW	-.15	-.15	.24*	.35**	.25*	.12
	Pooled Sig.	.915	.275	.024	.003	.024	.445
Humor	MW	.00	-.12	.31**	.01	.21*	.17
	CW	-.10	-.05	.29*	.33*	.29*	.14
	Pooled Sig.	.609	.319	.001	.031	.005	.090
<u>Comparison to Alternatives</u>							
	MW	.16	.05	.02	.13	-.03	-.24
	CW	.02	-.09	.10	.14	.17	.07
	Pooled Sig.	.332	.890	.498	.143	.392	.389

* $p < .05$, one-tailed, for the indicated sample; ** $p < .01$, one-tailed, for the indicated sample.

NOTE: MW = Mountain Warfare sample ($n = 69$). CW = Cold Weather Sample ($n = 62$). Pooled Sig. = Significance of the correlation for the combined samples.

Past Experience and Coping. The relationships between prior experience and coping strategies were examined in a series of MANOVAs using type of training (Mountain Warfare and Cold Weather) and prior training experience as the classification variables. Separate analyses were conducted with each type of prior training (cold weather, hot weather, jungle, mountain warfare) as the experience classification variable. The major findings were:

- (a) None of the sample by experience interactions were statistically significant ($p > .37$ for each).
- (b) Coping was related to prior cold weather training experience ($p < .012$), but not to the other types of prior training. In particular, comparing individuals who reported prior cold weather training to those with no such prior training, past cold weather experience was associated with more extensive use of Seeking Support (Cold Weather Mean = 1.02, S.D. = .63, versus Mountain Warfare Mean = 0.69, S.D. = .50, $t = 3.07$, $p < .003$, two-tailed), Problem Solving (Cold Weather Mean = 1.80, S.D. = .71, versus Mountain Warfare Mean = 1.58, S.D. = .71, $t = 1.81$, $p < .074$, two-tailed), and Positive Reappraisal (Cold Weather Mean = 1.90, S.D. = .73, versus Mountain Warfare Mean = 1.48, S.D. = .84, $t = 2.75$, $p > .007$, two-tailed).

DISCUSSION

The present study demonstrated differences in coping strategy between troops undergoing cold weather and warm weather training. Based on prior reports that negative emotional states are common in the cold, it was predicted that problem-solving coping strategies would be less common in the cold, while emotion-focused coping strategies would be more common. The prediction regarding emotion-focused coping strategies was supported. The primary coping difference between the cold and warm weather training samples was the greater use of escapist thinking about other times and places, one type of emotion-focused coping, in the cold. The prediction regarding problem-solving coping strategies was not supported. Although there was a trend toward less frequent use of problem solving as a means of coping in the cold, this difference was not statistically significant.

The prediction that differences in warm and cold weather coping strategies could account for differences in mood status was supported. As anticipated, cold weather training was associated with higher scores on negative mood indicators (anger, depression, fear/anxiety) and lower scores

on positive mood indicators (happiness, activity). It was important that Fatigue, an indicator of how physically demanding the training was, did not differ significantly between the two training groups. This finding suggests that the other mood differences probably reflected real differences in affect, rather than just an overall negative psychological reactions to cold weather training.

The mood differences between the two training groups could be explained by coping differences. Statistically controlling for the group differences in escapist thinking, the mood differences between the training groups were reduced to nonsignificance. Thus, even though only one coping variable differed significantly between the groups, the difference was sufficient to account for the observed pattern of differences in moods.

It was noteworthy that the coping-mood associations obtained in this study probably were not specific to cold weather. The pattern of associations obtained was generally consistent with a priori predictions based on research in other settings with samples that had different demographic characteristics than the present ones. In addition, the associations observed in cold weather training were comparable to those observed in warm weather training in the present study. The reasonable conclusion is that the type of coping strategy used by the troops was influenced by the circumstances of cold weather training, but the effects of each coping strategy, once enacted, were the same in this setting as in other settings.

The findings regarding the possibility that cold weather training teaches coping skills were equivocal. Prior cold weather training experience was related to more frequent use of Problem Solving, Positive Reappraisal, and Seeking Support. However, none of these coping strategies was higher in the Cold Weather sample compared to the Mountain Warfare sample when the two training programs were compared. In fact, the frequency of Problem Solving was slightly lower during cold weather training in these comparisons.

The major conclusion from this study is that maladaptive coping in the cold is a significant determinant of adverse emotional reactions to the cold. Cold weather training was associated with more frequent use of one type of maladaptive coping, i.e., thinking about better times and places, which would contribute to the negative emotions seen in the cold. If coping

theories are correct, this type of coping is a cause of adverse emotional reactions to the cold, but the correlational design of the present study does not provide a suitable basis for evaluating this theoretical claim. Additional research is needed to evaluate the processes of coping in cold weather training given the initial confirmation of the hypothesis that coping strategies are related to adverse psychological reactions in the cold. Further research should focus on identifying elements of the training program that elicit or foster different types of coping. Research to identify individuals at high risk for adverse reactions also would be useful. The combined product of these two lines of research would be information that would help structure training experiences to promote the learning of positive adaptations to the cold with a special emphasis on the factors that are most important for those at highest risk of adverse reactions. This type of information would help leaders develop and implement cold weather training programs that would minimize the adverse effects of the cold environment, as recommended in the current cold weather operations reference publication (9).

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19 ABSTRACT (Continue on reverse if necessary and identify by block number) Adverse emotional reactions are a recognized problem in cold weather operations. The present study tested the hypothesis that these reactions are related to coping strategies employed in the cold. The coping strategies and emotional status of men going through winter cold weather training were compared to those of men going through summer mountain warfare training. The men going through cold weather training reported higher levels of depressed mood, anger, and anxiety and lower levels of happiness and activity. These men also reported more frequent thoughts about other times and places as a means of coping. Coping strategies were moderately strong predictors of mood during both the winter and summer training programs, and analyses of covariance controlling for the group differences in coping by escapist thinking showed that this difference could account for the observed group differences in mood. The study confirmed that coping strategies are related to adverse emotional reactions in cold weather settings. Additional research to identify the specific factors in cold weather training that elicit maladaptive coping could help develop programs to foster positive coping.					
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